

## AMENDMENTS TO THE CLAIMS

The listing below of the claims presents in amended form claims 1 through 14 that were approved and accepted in the international phase of the corresponding PCT application. The following claims replace all prior versions and listings of claims in the present application:

### **Listing of Claims:**

Claim 1 (currently amended): A method of transmitting electric current to a furnace having a wall which is heated ~~, either completely or partially,~~ by electric current ~~transported~~ conducted in the furnace wall (1), ~~wherein said current is caused to be transmitted through~~ , said method comprising the steps of:  
providing a plurality of electrically conductive devices (2-8) connected to or in abutment with said that are in contact with the furnace wall, characterised by giving forming in at least one of the electrically conductive devices (2-4) at a position in the close proximity of to the furnace wall (1) a section (10-12) that has a smaller cross-sectional area than the remaining part of the electrically conductive device (2-4) concerned; wherewith the so that current flow through said smaller cross-section (10-12) is caused to develop cross-sectional area develops heat in the region of said smaller section (10-12) in cross-sectional area of a magnitude that ~~will correspond essentially or totally to~~ corresponds substantially with the heat magnitude (14) of heat that would have been ~~transported~~ transmitted from the furnace wall (1) to a respective electrically conductive device (2-4) in the absence of said smaller cross-sectional area.

Claim 2 (currently amended): A method according to Claim 1, ~~characterised by causing none or several of the~~ including the step of applying current to electrically conductive devices (5-8) that lack ~~such~~ a section of smaller cross-sectional area ~~also to carry current; and in that said none or several~~ dimensioning the electrically conductive devices ~~is/are dimensioned that lack a~~ smaller cross-sectional area so that heat flow developed therein ~~is caused~~ corresponds essentially to ~~correspond to the~~ a heat flow magnitude (14) that would have been ~~transported~~ transmitted from the furnace wall (1) to the electrically conductive devices (5-8) in the absence of said current in combination with the dimensioning of said conductive devices.

Claim 3 (currently amended): A method according to Claim 1 ~~or 2~~, ~~characterised by causing~~ , wherein the electrically conductive devices (2-8) in abutment contact with the furnace wall (1) ~~to form~~ are selected from the group consisting of electric current input devices, electric current output devices, supports, measuring devices ~~or other devices, or a combination~~ , and combinations thereof.

Claim 4 (currently amended): A method according to Claim 1, ~~2 or 3~~, ~~characterised by causing the cross-sectional~~ wherein surfaces of the electrically conductive devices (2-8) in direct contact with the furnace wall ~~to have mutually~~ the same or mutually different a cross-sectional shape selected from the group

consisting of square, circular, and rectangular shape ~~or some other shape~~; and ~~by giving~~ the cross-sectional areas mutually of the electrically conductive devices ~~have substantially~~ the same ~~or mutually a different~~ size.

Claim 5 (currently amended): A method according to Claim 1, ~~2, 3 or 4~~, ~~characterised by causing~~ including the steps of providing at least one or more of ~~the devices (2-8) to be an~~ electrically conductive device as an electric current input device; and ~~by causing~~ providing at least one or more of said devices (2-8) ~~to form~~ electrically conductive device as a current drainage output device, wherein the current is ~~caused to flow~~ flows through the furnace wall (1) by delivering said current through ~~the device or devices forming a~~ at least one current input device, and ~~by discharging the current~~ current passes from the furnace wall through the ~~device or devices that function as~~ at least one current ~~drainage devices~~ output device.

Claim 6 (currently amended): A method according to Claim 1, ~~2, 3, 4 or 5~~, ~~characterised in that these~~ including the step of providing in electrically conductive electrical current input devices placed in the proximity of ~~the volume of the~~ a furnace wall (1) volume where precision temperature control is desired ~~are either a) provided with waists (2-4) that define smaller cross-sectional area regions~~ of suitable dimensions for establishing an energy balance between ~~the~~ a thermal flow from the furnace wall and ~~the~~ a thermal flow induced by current provided to the current input device, ~~or b) to cause these devices to be current~~

~~carrying and dimensioned such that the current caused to flow through the device concerned will contribute to the development of heat that will establish an energy balance between the furnace wall and the current input device devices.~~

Claim 7 (currently amended): A method according to ~~any one of the preceding Claims, characterised by~~ claim 1, including the step of producing the furnace as a tube-like furnace from an FeCrAl material.

Claim 8 (currently amended): An arrangement for transmitting electric current to a furnace which is heated ~~, either totally or partially, by current transported~~ conducted in the a furnace wall (1), said ~~current being transmitted through~~ arrangement comprising: a plurality of electrically conductive devices (2-8) located in abutment with the furnace wall, characterised in that wherein at least one of the electrically conductive devices (2-4) has close to said furnace wall (1) a section (10-12) which has a smaller cross-sectional area than the remaining part of the electrically conductive device (2-4) concerned, wherein , so that electrical current passing through this smaller ~~cross-section (10-12) causes in the region of said smaller cross-section (10-12) the development of cross-sectional area generates~~ heat in a magnitude that corresponds ~~essentially or completely to~~ substantially with the magnitude of the heat (14) that would otherwise have ~~taken place~~ been conducted from the furnace wall (1) to the electrically conductive device (2-4) in the absence of said smaller cross-sectional area.

Claim 9 (currently amended): An arrangement according to Claim 8, ~~characterised in that none or several of the~~ wherein electrically conductive devices (5-8) that lack ~~such~~ a section of smaller cross-sectional area ~~also is/are~~ carry current carrying; and ~~in that said none or several~~ dimensioning the electrically conductive devices ~~is/are dimensioned~~ so that heat flow generated therein ~~will~~ corresponds essentially ~~correspond to the~~ to a heat transportation (14) flow magnitude that would have ~~taken place~~ been transmitted from the furnace wall (1) to the electrically conductive devices (5-8) in the absence of said current in combination with the dimensioning of said electrically conductive devices.

Claim 10 (currently amended): An arrangement according to Claim 8 or 9, ~~characterised in that~~ wherein the electrically conductive devices (2-8) in abutment with the furnace wall (1) are selected from the group consisting of current input devices, current output devices, supports, measuring devices or ~~other devices, or a mixture~~ and combinations thereof.

Claim 11 (currently amended): An arrangement according to Claim 8, 9 or 10, ~~characterised in that the~~ wherein areas of cross-sectional surfaces of the electrically conductive devices (2-8) in ~~direct~~ contact with the furnace wall (1) have ~~mutually the same or mutually different~~ shapes selected from the group consisting of square, circular and rectangular shapes ~~or some other shape~~; and

~~in that~~ said cross-sectional surfaces have ~~mutually~~ substantially the same or ~~mutually different~~ sizes.

Claim 12 (currently amended): An arrangement according to Claim 8, 9, ~~10 or 11, characterised in that~~ wherein at least one or more of the electrically conductive devices ~~(2-8) is/are~~ is a current input devices device; and ~~in that~~ at least one or more of the electrically conductive devices ~~(2-8) is/are~~ is a current drainage devices output device, and ~~where the~~ wherein current ~~is flowing~~ flows through the furnace wall (1) ~~by being supplied through that or those device/-s that is/are from~~ current input devices or ~~being discharged through that or those device/-s that is/are to~~ current discharge output devices.

Claim 13 (currently amended): An arrangement according to Claim 8, 9, ~~10, 11 or 12, characterised in that these~~ wherein electrically conductive devices placed in the proximity of the to a furnace wall (1) volume where precision temperature control is desired are ~~either a)~~ provided with waists (2-4) that define smaller cross-sectional area regions of suitable dimensions for establishing an energy balance between thermal flow from the furnace wall and ~~the~~ thermal flow induced by current flowing through a current input device, ~~or b) are current carrying and dimensioned such that the current flowing through the device in question will contribute to heat development that establishes an energy balance between the furnace wall and said current input device.~~

Claim 14 (currently amended): An arrangement according to ~~any one of~~  
~~Claims 8-13, characterised in that the tube-like~~ claim 8, wherein the furnace is a  
tubular furnace and is made of an FeCrAl material.